Template for ISB Documentation of Stressors

A. General Information:

1. Name or Location of Example/Approach: Everglades recovery/regional approach

2. Literature/Citations Used: This is definitely NOT an analysis of all that is being done in the Everglades, but I found this paper to be a useful summary of an approach (it was cited on their webpage as a good overview):

Gentile, J. H. et al. 2001. Ecological conceptual models: a framework and case study for ecosystem management for South Florida sustainability. The Science of the Total Environment 274: 231-53.

I realize this paper is 10 years old, but in many respects the Everglades is that much further along in their modeling to support restoration actions and so this description may not be that far from where the Bay Delta currently is in the process.

3. Reviewer(s): Judy Meyer

B. Specific Questions:

1. What stressors are considered?

Altered hydrologic regime, excess nutrients, mercury, land use change, climate change among others – sound familiar?

2. Are stressors categorized? If so, how?

No

3. Are the relations between stressors and management objectives modeled, and if so, how?

This is the key to their approach. A governor's commission set high level goals (sounds like Delta Commission to me). Two sets of conceptual models were then developed. The first is a societal model that delineates "the drivers or societal activities that result in the creation of the environmental stressors." In this case, that model identified water demand and disposal as being of primary importance. The second set of conceptual models were ecosystem models developed for 20 different landscape units in the region (e.g., Coastal Bay, Marl Prairie and Rocky Glades). The key point is that the lowest tier of the societal model is a set of environmental stressors that form the upper tier of the ecological model. Every stressor in the

ecological model needs to be on the bottom tier of the societal model. In other words, there is a key linkage between the ecological model and potential management actions. These potential management actions are then explored through scenario analysis that examines likely outcomes of different management practices.

4. If stressors are prioritized, describe the general approach.

They didn't attempt to prioritize stressors as such. Through the modeling and analysis they recognized that hydrologic regime was of primary importance. This doesn't surprise me as hydrologic regime is often considered "the master variable."

5. How might this approach be relevant to Bay Delta?

Conceptual model development is central to the process and used to explore likely consequences of different management actions. It seems like many of the ecological models may already be available for the Bay Delta from DRERIP and POD among others. And the group at Davis has developed some models that are like the societal models used here. The need for multiple ecological models for different ecosystems of the region is also the kind of approach that seems needed for the variety of environments in the Bay Delta.

The identification of ecological endpoints is a key component of the process of development of the ecological models, and those endpoints then become the target of PERFORMANCE MEASURES! I think Everglades restoration has developed a good set of performance measures, and I suspect it is because they were an integral part of the process from the beginning.

6. Follow up regarding additional questions/literature review/etc?